HOW TO MAKE BUBBLES

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Bubbles! How are they made? Why are they round?

You can blow bubbles with any mixture of soap and water, but add a "secret" ingredient and you'll get bigger and stronger bubbles!

Keep reading to find out more about bubbles, and to see our recipe!

Super Soap Solution

Follow this recipe using a "secret" ingredient to get stronger and better bubbles! Compare this recipe with any mixture of soap and water.

What You Need:

- Liquid dish soap (Joy or Dawn brands work best. Try to find one that doesn't say 'Ultra')
- Distilled water (tap water is okay, but distilled water makes the best bubbles)
- Clean container with lid
- Glycerin or light corn syrup

What You Do:

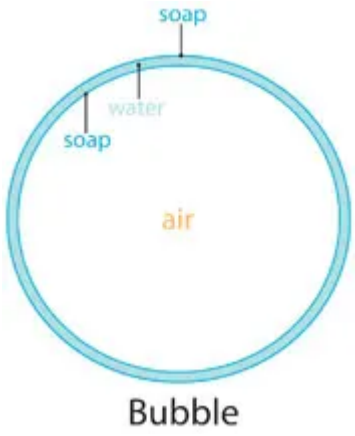
1. Measure 6 cups of water into one container, then pour 1 cup of dish soap into the water and slowly stir it until the soap is mixed in. Try not to let foam or bubbles form while you stir.
2. Measure 1 tablespoon of glycerin or 1/4 cup of corn syrup and add it to the container. Stir the solution until it is mixed together.
3. You can use the solution right away, but to make even better bubbles, put the lid on the container and let your super bubble solution sit overnight. (Note: If you used "Ultra" dish soap, double the amount of glycerin or corn syrup.)
4. Dip a bubble wand* or straw into the mixture, slowly pull it out, wait a few seconds, and then blow. How big of a bubble can you make? How many bubbles can you make in one breath?

*You can make your own bubble wand by cutting off the end of the bulb of a plastic pipet. Dip the cut end in solution and blow through the narrow end.

What Happened:

The soap mixture on the outside of a bubble is actually made of three very thin layers: soap, water, and another layer of soap. This "sandwich" that is on the outside of a bubble is called a soap film. A bubble pops when the water that is trapped between the layers of soap evaporates.

The glycerin or corn syrup mixes with the soap to make it thicker. The thicker skin of the glycerin bubbles keeps the water from evaporating as quickly, so they last longer. It also makes them stronger, so you can blow bigger bubbles.



Surface Tension and Soap

Find out how bubbles work with this experiment. You won't actually blow any bubbles, but you will learn the science that makes a bubble!

What You Need:

- 2 short glasses of water
- A pie plate or tray
- Liquid dish soap

What You Do:

1. Put the first glass of water in the center of the pie plate.
2. Slowly pour some water from the second glass into the first glass until it is very full and the water forms a dome above the rim of the first glass. Set the glass with less water aside.
3. Carefully stick your finger straight down through the dome of the water in the full glass and watch what happens.
4. Now put a small drop of dish soap on the tip of your finger and do the exact same thing - stick the finger with soap on it straight down through the dome of water. This time what happens?

What Happened:

Water is made up of lots of tiny ***molecules***. The molecules are attracted to each other and stick together. The molecules on the very top of the water stick together very closely to make a force called ***surface tension***.

Surface tension is what caused the water to rise up above the rim of the glass in the experiment - the water molecules stuck together to make a dome instead of spilling over the side.

Why didn't the dome break when you stuck your finger through it? Why didn't the water spill over the glass? Well, the surface tension was strong enough that it just went around your finger. The water molecules still stuck to each other and nothing spilled!

What happened when you put your soapy finger into the water? The soap on your finger broke the water's surface tension and some of the water molecules didn't stick to each other any more and they were pushed out of the glass!

The force of surface tension also creates bubbles. In plain water, the surface tension is strong and the water might make some bubbles, but they will not last very long and they will be very small, because the other molecules in the water will pull on the bubbles and flatten them.

Soap needs to be mixed with the water to make bubbles that can float through the air. When you add soap, the water becomes flexible, sort of like elastic, and it can hold the shape of a bubble when air is blown into it.

Bubble Tricks

After you make the super bubble solution and let it set for at least one day, try doing some of these cool bubble tricks! Can you think of any of your own tricks to do with bubbles?

What You Need:

- Super bubble solution in a container with a lid (from the experiment above)
- Pipe cleaners or wire
- Drinking straws
- Bubble blower (from the experiment above)
- Pointy objects like scissors and a pencil

How To Do The Tricks:

Trick 1 - A Square Bubble?

You will need two pipe cleaners and your super bubble solution for this trick.

1. Bend a pipe cleaner into a square. Wrap the ends around the sides of the square to hold it together. Fold the other pipe cleaner in half and loop it around one side of the square. Twist the ends together to make a handle. Use it as a bubble blower.
2. Dip the bubble blower into the bubble solution and slowly blow a bubble through it until the bubble comes loose from the wand. What shape is the bubble?

What Happened:

The bubble was round even though it came from a square! Bubbles are always round when they detach and float through the air because the skin of soap always tries to take up the least amount of space it can and still keep the same amount of air inside the bubble. The soap molecules always stretch into a round shape automatically! A round shape takes up less space than a square shape. Try the trick again, but make a wand in any shape you want - what about a star or a triangle? Do bubbles from those shapes become round too?

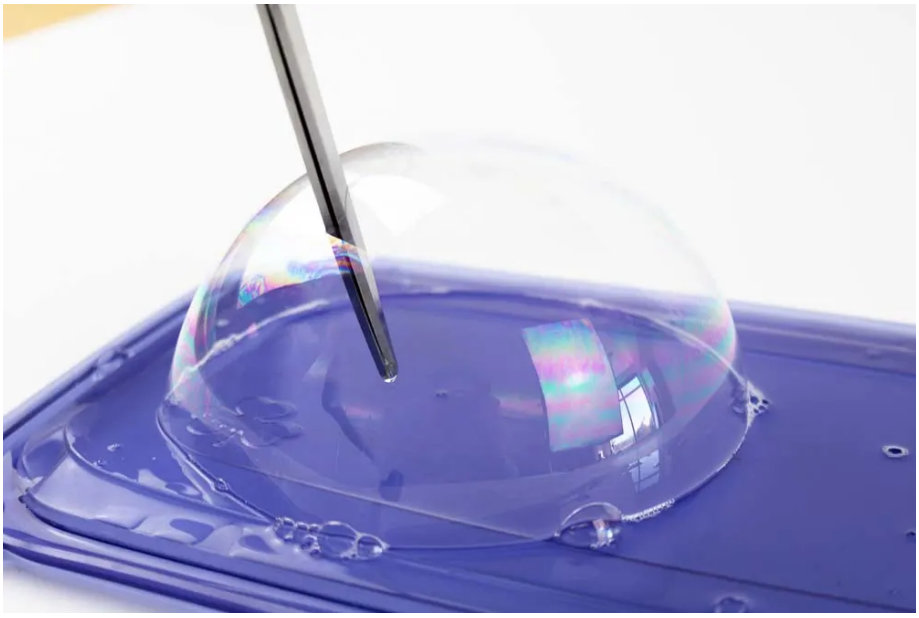
Trick 2 - Don't Pop the Bubble!

You will need the super bubble solution, the lid from the container, a straw, and some objects with pointed ends.

1. Set the lid on the table so that the part with the lip is facing up. Fill the lid with bubble solution.
2. Dip your straw into the bubble solution container so that it is wet half way up the straw. Touch the straw to the lid and blow a bubble on the lid. Slowly pull the straw all the way out of the bubble.
3. Now dip the pointed end of your scissors (or any pointy object) into the container of bubble solution. Make sure they are completely wet. Poke the scissors through the wall of your bubble. Watch what happens. Try it again with other pointed objects, just make sure anything you touch to the bubble is wet. Can you stick your finger through the bubble?

What Happened:

You should have been able to push the scissors through the wall of the bubble without popping it! When something wet touches a bubble, it doesn't poke a hole in the wall of the bubble, it just slides through and the bubble forms right around it.



The bubble solution on the scissors filled in the hole that would have been made. If you try poking dry scissors through your bubble, you will see it pop instantly!

(If it popped when you put the wet scissors in, something was probably too dry. Try it again and make sure anything that touches the bubble is completely wet with bubble solution.)

For another trick, get one hand completely wet in the bubble solution then use the other hand to hold your bubble blower and blow a big bubble in the palm of your wet hand.

Try a couple more tricks:

- Make a big dome bubble on the lid like you did above, then get the straw wet again, insert it into the bubble, and see if you can blow a smaller bubble inside the bigger one!
- Get one hand completely wet in the bubble solution then use the other hand to hold your bubble blower and blow a big bubble in the palm of your wet hand.

Science Words

Molecule- a very tiny part of a substance that is too small to see with your eyes. A water molecule is smaller than one drop of water!

Surface tension- molecules in a liquid are attracted to each other and make the top of the liquid very tight. The surface tension is what causes water to form drops. It also makes a dome shape across the top of a container that is filled to the top.

Evaporate- when a liquid dries up and goes into the air. The liquid is then in the air, but it is a vapor or a gas now and you can't see it. When we say the air is humid, it means that a lot of water has evaporated into the air and now water vapor (gas) is floating around in the air. It makes the air moist and heavy, and it might make you feel sticky when you go outside.

Learn About Bubbles

What Are Bubbles?

Bubbles are pockets of soap and water that are filled with air. When soap and water are mixed together and air is blown into the mixture, the soap forms a thin skin or wall and traps the air, creating a bubble.

Soap bubbles are not the only kind of bubbles. You can find bubbles in lots of liquids. You might see small bubbles in plain water, but they will always be in the water, or floating on the surface of the water, not floating through the air.

There are bubbles in soda pop, too. The special thing about soap bubbles is that they can float freely in the air; they don't have to be touching water or another liquid like most bubbles do. Can you find other bubbles around your house? What about something that is round and filled with air like a bubble?

(Some examples are balls, balloons, and bubble wrap.)

How does soap help make bubbles out of water? Soap makes the ***surface tension*** of water weaker than normal.

It also forms a very thin skin that is more flexible than water. When air gets trapped under the surface of the mixture of soap and water, the flexible skin stretches into a sphere shape (round like a ball), making a bubble!

You can see the flexible skin that forms a bubble by dipping a bubble wand into some bubble solution. When you pull it out, the hole will be filled with a stretchable skin of liquid. If you blow gently on the skin, you'll blow a bubble!

What Happens to Bubbles?

Since bubbles are made from soap and water, they can only last as long as the water lasts. In dry air, water ***evaporates*** - it is soaked up by the dry air around the bubble and the skin of the bubble gets thinner and thinner until it finally pops!

Evaporation isn't the only thing that pops bubbles. Anything dry can pop them. When a bubble floats through the air and lands on your finger, on a blade of dry grass, the wall of your house, or your pet's fur, the bubble will pop.

When something sharp and dry touches the bubble, it pokes a hole in the bubble's skin, all the air goes out of it, and the bubble disappears! To learn how to touch a bubble without popping it, do Trick 2 in the Bubble Tricks experiment.

Why Are Bubbles Round?

Bubbles that float in the air and are not attached to anything are always round because the thin wall of soap is pulling in while the air inside of it is pushing out. A bubble always tries to take up the smallest amount of space and hold the most air that it possibly can.

A sphere, the round ball-shape of a bubble, is the best way to take up a little space and hold a lot of air. Even when a bubble starts out as a square or another shape, like in Trick 1 from the Bubble Tricks experiment, it will always turn into a round

sphere as soon as it floats away into the air. A square bubble would take up more space than a round one.

There are a few times when bubbles are not round. Sometimes the wind blows them into different shapes. When bubbles are surrounded by lots of other bubbles, the ones in the middle get squished into other shapes, like squares or hexagons (shapes with six sides).

Try blowing a lot of bubbles right next to each other in a shallow container and see if there are any that are not round. If you pop the bubbles on the outside, the ones on the inside will not be squished anymore and they will push back out to round bubbles again!

Bubble Worksheet

For more bubble blowing fun, use this worksheet for ideas of common objects to try making bubbles with. Kids can also find other objects that work for making bubbles and draw them in the space provided.